Date: April 19th, 2010

Title: Scientific Notation part 2

Lesson Objective:
To utilize scientific notation in real world problems and to use a calculator to work with scientific notation.

IN:

Write the following in standard (decimal) notation:

1) 5.3×10^{4}
2) -7.02×10^{0}
3) 3×10^{-3}

Write the following in Scientific Notation:

1) 5.3×10^{4}
2) -7.02×10^{0}
3) 3×10^{-3}

Using your calculator:

Set your calculator to Scientific Notation Mode:

- Hit the MODE button (1st row, 2nd column)
- "Normal" should be highlighted.
- Use the right arrow key to go to SCI.
- Hit enter.
- Quit and go home...(2nd MODE = Quit)
- Type 50000 and hit enter.
- Your calculator will display its version of $5 \text{ X } 10^{4}$

Use your calculator to help you fill out the table:

Standard Notation	Scientific Notation
250 -5,530 14,000 7,000,000 18 -470,000 0.003 0.2 0.0000568	?

W2L:

Describe the difference between how you would write a number in scientific notation and how it looks on a calculator.

In the real world:

Meredith is doing a report on stars and wants an estimate for the total number of stars in the universe. She finds out that astronomers estimate that there are at least 125 BILLION galaxies in the universe. Wikipedia says that the Milky Way, the earth's galaxy, is estimated to contain more than 100 billion stars. Estimate the number of stars in the universe. Give your answer in scientific notation.

$$(125 \times 10^9)(100 \times 10^9)$$
$$125 \times 100 \times 10^9 \times 10^9$$
$$125 \times 10^{20}$$
$$1.25 \times 10^2 \times 10^{20}$$
$$1.25 \times 10^{22}$$

Owen insists on reading his calculator's display as:
"three point five to the seventh."

Bethany tells him that he should read it as:
"three point five times ten to the seventh."

He says, "They are the same thing. Why say all those extra words?"

Write Owen's and Bethany's expressions in expanded form, and evaluate each to show Owen why they are not the same thing.

Cal and Al were assigned this multiplication problem for homework:

Cal got an answer of 51.8×10^9, and Al got 5.18×10^{10}

Are Cal's and Al's answers equivalent?

Whose answer is in scientific notation?

Find another exponential expression equivalent to Cal's and Al's answers.

Consider these multiplication expressions:

$(2 \times 10^5)(3 \times 10^8)$ **$(6.5 \times 10^3)(2.0 \times 10^5)$**

- Set your calculator in scientific notation mode and multiply each expression.
- Explain how you could do the multiplication of $(2 \times 10^5)(3 \times 10^8)$ without using a calculator.
- Find the product $(4 \times 10^5)(6 \times 10^7)$ and write it in scientific notation without using your calculator.

Review!

Write each number in scientific notation.

200

5

48,900

$-9{,}043{,}000$

Write each number in standard notation.

3.14×10^3

5.2×10^6

6.59×10^7

-1.8×10^5

Review!

Use the properties of exponents to rewrite each expression.

$2x^3(5x)$

$(-4m^2)^3$

$5w(3w^8 - w^6)$

$3x^3(-2x^5)$

$-6r^3(r^4 - 3r^2)$

$x^3(2x^2 + 3x - 4)$

$(4s^2t^3u^4)^3$

$(m^2n)(m^9n^3)$

Summary:
Something new I learned about Scientific Notation is…

Out:

A human heart beats about 65 times per minute. By the time you are 25 years old, approximately how many times will your heart have beaten? Express your answer in scientific notation.

Homework:
Find a real-world problem that utilizes Scientific Notation on the internet. Print it out and describe what the problem is pertaining to.